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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/672,366	09/26/2003	Yu Chen	6565-6701/RJP	3036

7590 02/22/2007  
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EXAMINER
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WATTS, ALLISON LEIGH

ART UNIT	PAPER NUMBER
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1753

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/22/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/672,366	CHEN ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Allison L. Watts	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 September 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 1-13 and 25-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 9/23/06 and 11/30/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-13, 25, and 27-30 are drawn to a product and method of making, classified in class 204, subclass 403.01.
  - II. Claims 14-24, drawn to a method, classified in class 427, subclass 123.
  - III. Claim 26, drawn to a process of using, classified in class 205, subclass 777.5.
  - IV. During a telephone conversation with Richard Polley on 1/24/2007 a provisional election was made with traverse to prosecute the invention of Group II, claims 14-24. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-13 and 25-30 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.
2. Inventions Group I and Group II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product claimed could be made using a method, such as sputtering and photolithography.

Art Unit: 1753

3. Inventions Group III and Group I are related as mutually exclusive species in an intermediate-final product relationship. Distinctness is proven for claims in this relationship if the intermediate product is useful to make other than the final product, and the species are patentably distinct (MPEP § 806.05(j)). In the instant case, the intermediate product is deemed to be useful as an electrode in any type of electrochemical sensor and the inventions are deemed patentably distinct because there is nothing on this record to show them to be obvious variants.
4. Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions require a different field of search (see MPEP § 808.02), restriction for examination purposes as indicated is proper.
5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 1753

7. Claims 19 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Claim 19 recites the limitation "said coating". There is insufficient antecedent basis for this limitation in the claim. For the purpose of writing this office action, the examiner has assumed that claim 19 refers to claim 17.

9. Claim 20 recites the limitation "said ferrocene compound". There is insufficient antecedent basis for this limitation in the claim. For the purpose of writing this office action, the examiner has assumed that claim 20 refers to claim 17.

***Claim Rejections - 35 USC § 102***

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 14, 16, and 22-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Chan et al.

As to Claim 14, Chan et al. disclose a method of forming an electrochemical chip (paragraph 0022) comprising forming a first plate by depositing a conductive layer (5,3) on a first support (6) (Figure 1), and etching said conducting layer to form an electrode array (paragraphs 0159 and 0160); forming a second plate by etching an opening in a

Art Unit: 1753

second support; bonding the first and second plates to define a cavity, with the electrode array being within the cavity (Figure 9B, paragraphs 0072 and 0103).

As to Claim 16, Chan et al. disclose the opening being a depression (Figure 9B).

As to Claim 22, Chan et al. disclose forming the first support by depositing an insulation layer on a silicon wafer (Figure 9C, paragraphs 0051 and 0166).

As to Claim 23, Chan et al. disclose depositing an overlying insulation layer over said conducting layer about a periphery of said array (Figure 9D, paragraph 0030), with the second plate being bonded to the first plate at the overlying insulation layer (Figure 9B).

As to Claim 24, Chan et al. disclose the second support comprising a silicon wafer (paragraphs 0051, 0166, and 0072).

### ***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

Art Unit: 1753

3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

15. Claims 14-15 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hintsche et al. in view of Chan et al.

As to Claim 14, Hintsche et al. disclose a method of forming an electrochemical chip (column 1, lines 8-11 and column 4, lines 41-50) comprising forming a first plate including a first support (8) and an electrode array (1); forming a second plate by etching an opening in a second support (9); bonding the first and second plates to define a cavity, with the electrode array being within the cavity (Figure 2B, Column 2, lines 45-54).

Hintsche et al. disclose forming a first and second plate, but do not disclose forming a first plate by depositing a conductive layer on a first support and etching said conducting layer to form an electrode array.

Art Unit: 1753

Chan et al. disclose a method of forming an electrochemical chip (paragraph 0022) comprising forming a first plate by depositing a conductive layer (5,3) on a first support (6) (Figure 1), and etching said conducting layer to form an electrode array (paragraphs 0159 and 0160); forming a second plate by etching an opening in a second support; bonding the first and second plates to define a cavity, with the electrode array being within the cavity (Figure 9B, paragraphs 0072 and 0103).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the method of using etching to form an electrode array as disclosed by Chan et al. for the electrodes of Hintsche et al. because etching is a standard fabrication technique that may be used to form any desired pattern (paragraphs 0159 and 0160).

As to Claim 15, Hintsche et al. disclose the opening being a window (4,5) (Figure 2B).

As to Claim 22, Hintsche et al. disclose forming the first support by depositing an insulation layer (column 3, lines 8-17) on a silicon wafer (column 4, lines 41-50).

As to Claim 23, Hintsche et al. disclose depositing an overlying insulation layer (6) over the electrode array,

Hintsche et al. do not disclose an insulation layer between the first and second supports (Figure 1, column 4, lines 34-40).

Chan et al. disclose depositing an overlying insulation layer over said conducting layer about a periphery of said array (Figure 9D, paragraph 0030), with the second plate being bonded to the first plate at the overlying insulation layer (Figure 9B).



Art Unit: 1753

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the insulation layer of Chan et al. between the first and second supports of Hintsche et al. in order to insulate the cavity (paragraph 0032).

As to Claim 24, Chan et al. disclose the second support comprising a silicon wafer (column 4, lines 41-50).

16. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Hintsche et al. or Chan et al., as described in paragraphs 11 and 15, and as applied to Claim 14, in view of Cui et al.

As to Claims 17 and 19, Chan et al. disclose using electrodes (paragraph 0056) with a moiety attached (paragraph 0058). Chan et al. also disclose ferrocene and its derivatives as being commonly used moieties in electrochemical applications for electron transfer or reduction and oxidation reactions (paragraph 0128).

Cui et al. disclose experimenting with electron transfer reactions using electrodes with a supported bilayer lipid membrane coating doped with a ferrocene compound (Abstract).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the coated electrodes of Cui et al. for the electrodes of Chan et al. because electrodes with a ferrocene modified lipid bilayer membrane coating are useful in electrochemical devices for controlling current (Conclusion).

As to Claim 18, Chan et al. do not disclose oxidizing the ferrocene compound.

Cui et al. disclose oxidizing the ferrocene compound (page 246, column 1).

Art Unit: 1753

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the electrodes of Chan et al. by oxidizing the ferrocene compound on the electrodes as disclosed by Cui et al. because the oxidation reaction is thermodynamically favorable, as opposed to the reduction reaction (page 246, column 2).

17. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over either Hintsche et al. or Chan et al., and Cui et al., as applied to Claim 17, in view of Nelson et al.

Chan et al. disclose ferrocene derivatives as being commonly used moieties in electrochemical applications for electron transfer or reduction and oxidation reactions (paragraph 0128).

Chan et al. do not disclose the ferrocene compound being benzoyl ferrocene.

Nelson et al. disclose using benzoyl ferrocene (paragraph 0055) as an electrode coating (paragraph 0048).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the benzoyl ferrocene coating of Nelson et al. for the electrodes of Cui et al. because it is able to control electrostatic dissipative and can control electrical resistivity (paragraphs 0006 and 0013).

18. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chan et al., Hintsche et al., and Cui et al., as applied to Claim 17, in view of Nelson et al.

Art Unit: 1753

Chan et al. disclose forming common electrodes with interconnects leading outwardly from the electrode array (paragraphs 0025 and 0096). Chan et al. also disclose etching as being a standard fabrication technique (paragraphs 0159 and 0160).

Chan et al. do not disclose etching conducting lines.

Singh et al. disclose an electrochemical chip with a nonconductive substrate plated with a conductive material (paragraph 0014), and etching electrodes (71) and conducting lines (72) (paragraph 0063 and Figures 5B and 5C).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the method of etching conducting lines by Singh et al. for the conducting lines of Chan et al. because etching is a common fabrication method.

### ***Conclusion***

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 20030217918 A1, US 20040248282 A1, US 20040000483 A1, US 6540891 B1.

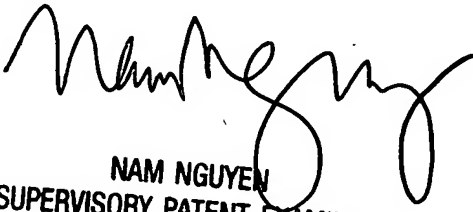
20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allison L. Watts whose telephone number is (571) 272-6640. The examiner can normally be reached on Monday through Friday, 9:00 am to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1753

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ALW  
1/30/2007



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